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SOIL CONSERVATION

LAND USE AND SOIL EROSION

The threat of soil erosion is not new. Many of the civilisations of the ancient world continually struggled against its advance into their farmlands. In recent times, the virtually uncontrolled exploitation of large areas of the newly settled continents, America and Australia, has resulted in a serious loss of natural soil resources over wide areas. Soil erosion on such a scale is usually caused by poorly conceived and badly implemented land use. The clearing of hills and slopes, bare following of marginal lands, and excessive grazing by domestic and wild animals have resulted in widespread erosion in settled areas.

Agents of Erosion

The erosion of soil may take place through the agency of water or wind. The major types of water erosion are:—sheet erosion, where the surface soil is removed over large areas; gully erosion, where the soil and sub-soil is gouged out in localised areas to produce gullies; tunnel erosion, where the sub-soil is washed downhill beneath the surface with a resultant collapse of the unsupported surface soil: and stream erosion, which results in an undermining and subsidence of the banks of flooding rivers and creeks.

Each of these types of erosion may have apparently harmless beginnings, but the speed at which they may develop, if uncontrolled, is rapid and dramatic.

Wind erosion is the dominant type of erosion in dry areas where plant growth is sparse and soil particles are loose and free to move. Wind erosion has a similar effect to sheet erosion caused by water, in that it leaves the surface bare and scalded, retarding plant growth and rendering the land agriculturally useless. Coarse particles may be eddied by the wind into local dunes, but the smaller, lighter particles blow for many miles as dust. Dunes shift continually unless colonised by plant life, and may cover fences, roads, paddocks and even buildings.

The presence of soluble salts in the surface layers of the soil has been a contributing cause to both wind and water erosion over large areas of South Australia and Western Australia. The destruction of plants by comparatively small amounts of residual salt in the top soil and breakdown in the soil structure considerably increase susceptibility to agents of erosion.

Prevention and Control

Effective techniques for checking, as opposed to avoiding, both water and wind erosion have been devised. Of these, the formation of contour banks, contour ploughing, the growing of wind breaks and the stabilising of loose soil by crops are the simplest. Contour ploughing of hillsides frequently prevents water from flowing downhill. In other cases, where the slope is greater, contour banks will successfully retain and divert water flow into absorption areas. On gently sloping grazing land, run-off can often be successfully controlled by well-spaced furrows, ploughed on the contour. Trees planted in the form of shelter belts and windbreaks can provide excellent counters to wind erosion in exposed areas. Superior to all these techniques, however, is the stabilisation of surface soil by the provision of permanent, adequate vegetative cover. Hence a considerable volume of research has been devoted to selecting plants suitable for vegetative regeneration in areas which experience long dry periods.

Soil Conservation Service

The seriousness of the threat of soil erosion to Australia was not generally appreciated until the early 1930's. But in 1936, all States were requested by the Commonwealth government to form soil conservation committees to promote and Co-ordinate efforts to combat this wastage of soil resources. From this time onward, Interest in soil conservation has continued to expand.

With the introduction of the **Soil Conservation Act** of 1938 and the subsequent establishment of the Soil Conservation Service, New South Wales was the first Australian State to establish an organisation to be concerned solely with soil conservation. Victoria followed next, in 1940, when the **Soil Conservation Act** was passed to authorise the establishment of the Soil Conservation Board (now Soil Conservation Authority). Although the other Commonwealth States and Territories do not possess separate bodies devoted to soil conservation they do have specialised conservation sections within their Departments of Agriculture. In all cases, a common aim of conserving the soil provides these soil conservation groups with a wide charter. This involves the protection of the catchment areas, advice and assistance to land-holders, and the close cooperation of all Commonwealth, State and local government authorities concerned with matters of conservation. In some States, conservation research stations provide facilities where research into the prevention and control of erosion may be conducted.

In 1946, a Commonwealth Standing Committee on Soil Conservation was established on the recommendation of the Australian Agricultural Council. This Committee consists of heads of the State soil conservation organisations and representatives from the Commonwealth Departments of Primary Industry and Interior and the Commonwealth Scientific and Industrial Research Organisation. The main functions of the Committee are to coordinate the work of State soil conservation services, to obtain the cooperation and assistance of trained personnel in related fields, and to undertake special research projects in consultation or collaboration with the States.

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